

See Article page 68.



Commentary: One is as good as three

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Pulmonary artery endocarditis is rare, and prosthetic pulmonary valve endocarditis is rarer still. It presents a surgical challenge. In this issue of the *Journal*, Garcia-Rinaldi and colleagues¹ applied an innovative method to replace a pulmonary bioprosthesis infected with methicillin-resistant *Staphylococcus aureus*. Because a cryopreserved aortic or pulmonic homograft was not available, they used a modified cadaveric cryopreserved pulmonary artery homograft that contained one cusp, created by excising a segment of the homograft containing the arterial wall and a cusp. Normally, the authors use this in venous reconstruction of the lower extremities. This monocusp pulmonary artery patch was used to replace the infected pulmonary bioprosthesis. The patient recovered uneventfully and at 2-year follow-up showed a fully competent valve.

The authors appropriately chose replacement rather than simple excision of the infected prosthesis with subsequent repeat valve replacement because of the adverse effects of right ventricular volume overload in the absence of the pulmonic valve.

The monocusp pulmonary valve has been applied in congenital heart surgery for years, using a variety of materials including autologous pericardium, bovine pericardium, aortic or pulmonary homografts, and prosthetic materials.²⁻⁶ Pulmonary homograft monocusp reconstruction of the outflow tract in infants age <1 year with tetralogy of Fallot showed 85% freedom from replacement at 10 years.⁷ Conduits of all types are known to calcify and fail, especially in younger patients, and

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CENTRAL MESSAGE

Innovation is key to success in management of prosthetic pulmonary endocarditis using a cryopreserved pulmonary monocusp.

reoperations are not uncommon. Based on the current literature, it is impossible to extrapolate the fate of the monocusp patch in the 32-year-old patient described in this report.

The nonuse of any prosthetic material was crucial to the successful outcome. The described operation seems simple. Curiously, the monocusp seemed to adequately fill the pulmonary artery and maintain valve competence. In one study, the mean Doppler echocardiographic determination of pulmonary valve orifice area in normal adults was $3.01 \pm 0.36 \text{ cm}^2$ ($2.02 \pm 0.20 \text{ cm}^2/\text{m}^2$) with a modest correlation with body surface area.⁸ No difference was observed between males and females. Normally, this area is covered by 3 pulmonic leaflets. The authors chose a monocusp patch that worked well and must have covered the area adequately, because there was no pulmonic insufficiency immediately postoperatively. Perhaps they could have assembled a patch with 2 leaflets if one had not sufficed. I suspect that intuition and good surgical judgment guided their choice.

Garcia-Rinaldi and colleagues are to be congratulated on a very innovative approach to a difficult problem.

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